UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,891	03/31/2006	Tatsuo Hoshino	21421 US C038435/0185661	4642

7590 10/02/2007

Stephen M Haracz
Bryan Cave
1290 Avenue of the Americas
New York, NY 10104-3300

EXAMINER	
FRONDA, CHRISTIAN L	
ART UNIT	**PAPER NUMBER**
1652	
MAIL DATE	**DELIVERY MODE**
10/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,891	HOSHINO ET AL.	
	Examiner	Art Unit	
	Christian L. Fronda	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4 and 6-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4 and 6-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3, 4, and 6-8 are pending and under consideration in this Office Action.

2. Applicants' submission of a copy of the Sequence Listing attached to the amendment dated 07/12/2007 has been acknowledged. The application now complies with the requirements of 37 CFR §§ 1.821 through 1.825 for applications containing nucleotide and/or amino acid sequences.

3. The disclosure stands objected to because there is no statement that indicates that the instant application claims foreign priority under 35 U.S.C. 119(a)-(d) to foreign patent application EPO 02021623.0 filed 09/27/2002.

The oath filed 03/31/2006 indicates a claim to foreign priority to EPO 02021623.0 filed 09/27/2002 35 U.S.C. 119(a)-(d). This information should appear in the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet. Appropriate correction is required.

Claim Rejections - 35 U.S.C. § 112, 1st Paragraph

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 3, 4, and 6-8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for (1) a recombinant *E.coli* host transformed with plasmids comprising a polynucleotide encoding erythrose 4-phosphate dehydrogenase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 1 and SEQ ID NO: 2, a polynucleotide encoding 1-deoxy-D-xylulose-5-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 5 and SEQ ID NO: 6, and a polynucleotide encoding pyridoxol 5'-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 9 and SEQ ID NO: 10, where said recombinant *E.coli* host overproduces vitamin B6 compared to an untransformed *E.coli* host, and (2) a process for preparing vitamin B6 comprising culturing said recombinant *E.coli* host; does not reasonably

provide enablement for any other embodiment as recited in the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. Applicants' arguments filed 09/17/2007 have been fully considered but are not persuasive for reasons of record as further explained below.

As stated in the previous Office Action, the specification provides guidance and working examples for a recombinant *E.coli* host (AT1024/pKK-epd/pVK-pdxJ/pSTV-dxs) transformed with plasmids comprising a polynucleotide encoding erythrose 4-phosphate dehydrogenase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 1 and SEQ ID NO: 2, a polynucleotide encoding 1-deoxy-D-xylulose-5-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 5 and SEQ ID NO: 6, and a polynucleotide encoding pyridoxol 5'-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 9 and SEQ ID NO: 10, where said recombinant *E.coli* host overproduces vitamin B6 compared to an untransformed *E.coli* host, and a process for preparing vitamin B6 comprising culturing said recombinant *E.coli* host.

The nature and breadth of the amended claims encompass any recombinant microorganism belonging to the genus *Escherichia* capable of producing vitamin B6 which carries extra genes coding for any erythrose 4-phosphate dehydrogenase, any 1-deoxy-D-xylulose-5-phosphate synthase, and any pyridoxol 5'-phosphate synthase, where the genes and enzymes are from any biological source for which no structure and amino acid or nucleotide sequence is apparent, and any process for preparing vitamin B6 using said recombinant microorganism.

However, the specification does not provide guidance, working examples, or prediction for making any recombinant microorganism belonging to the genus *Escherichia* capable of producing vitamin B6 other than the above mentioned *E.coli* host (AT1024/pKK-epd/pVK-pdxJ/pSTV-dxs) transformed with plasmids comprising a polynucleotide encoding erythrose 4-phosphate dehydrogenase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 1 and SEQ ID NO: 2, a polynucleotide encoding 1-deoxy-D-xylulose-5-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 5 and SEQ ID NO: 6, and a polynucleotide encoding pyridoxol 5'-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 9 and SEQ ID NO: 10, where said recombinant *E.coli* host overproduces vitamin B6 compared to an untransformed *E.coli* host.

An undue amount of trial and error experimentation must be preformed where such experimentation involves searching and screening a vast number of biological sources for any gene encoding any erythrose 4-phosphate dehydrogenase, any 1-deoxy-D-xylulose-5-phosphate synthase, and any pyridoxol 5'-phosphate synthase; transforming the genes into any recombinant microorganism belonging to the genus *Escherichia*; and determining if the transformed recombinant microorganism can produce vitamin B6. General teaching regarding screening and

searching for the claimed invention is not guidance for making the claimed invention. Thus, the specification has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims.

Amending the claims to recite a recombinant *E. coli* transformed with polynucleotides having specific SEQ ID NOs encoding erythrose 4-phosphate dehydrogenase, 1-deoxy-D-xylulose-5-phosphate synthase, and pyridoxol 5'-phosphate synthase would help in overcoming the rejection.

6. Claims 1, 3, 4, and 6-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants' arguments filed 09/17/2007 have been fully considered but are not persuasive for reasons of record as supplemented below.

The amended claims are drawn to a genus of recombinant microorganisms belonging to the genus *Escherichia* comprising a genus of erythrose 4-phosphate dehydrogenases, a genus of 1-deoxy-D-xylulose-5-phosphate synthases, and a genus of pyridoxol 5'-phosphate synthases for which no structure and amino acid or nucleotide sequence is apparent. The scope of the each genus includes many members with widely differing structural, chemical, and physiochemical properties including widely differing amino acid sequences, structures, and biological functions. Furthermore, each genus is highly variable because a significant number of structural and biological differences between genus members exist.

As stated in the previous Office Action, the specification discloses a recombinant *E.coli* host AT1024/pKK-epd/pVK-pdxJ/pSTV-dxs transformed with plasmids comprising a polynucleotide encoding erythrose 4-phosphate dehydrogenase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 1 and SEQ ID NO: 2, a polynucleotide encoding 1-deoxy-D-xylulose-5-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 5 and SEQ ID NO: 6, and a polynucleotide encoding pyridoxol 5'-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 9 and SEQ ID NO: 10, where said recombinant *E.coli* host overproduces vitamin B6 compared to an untransformed *E.coli* host, and a process for preparing vitamin B6 comprising culturing said recombinant *E.coli* host AT1024/pKK-epd/pVK-pdxJ/pSTV-dxs.

The above stated recombinant *E.coli* host AT1024/pKK-epd/pVK-pdxJ/pSTV-dxs is insufficient to be representative of the attributes and features common to all the members of each claimed genus. The above stated polynucleotide encoding erythrose 4-phosphate dehydrogenase

obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 1 and SEQ ID NO: 2, a polynucleotide encoding 1-deoxy-D-xylulose-5-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 5 and SEQ ID NO: 6, and a polynucleotide encoding pyridoxol 5'-phosphate synthase obtained from *E.coli* chromosomal DNA by PCR using primers of SEQ ID NO: 9 and SEQ ID NO: 10 is insufficient to be representative of the attributes and features common to all the members of a genus of erythrose 4-phosphate dehydrogenases, a genus of 1-deoxy-D-xylulose-5-phosphate synthases, and a genus of pyridoxol 5'-phosphate synthases for which no structure and amino acid or nucleotide sequence is apparent.

The specification does not describe and define any structural features, amino acid sequences, and biological functions that are commonly possessed by members of the each genus. The specification fails to provide a written description of additional recombinant microorganisms being capable of producing vitamin B6. Thus, one skilled in the art cannot visualize or recognize the identity of the members of each genus. In view of the above considerations, one of skill in the art would not recognize that applicants were in possession of the claimed genus of recombinant microorganisms and process for producing vitamin B6 using the claimed genus of recombinant microorganisms.

Amending the claims to recite a recombinant *E. coli* transformed with polynucleotides having specific SEQ ID NOs encoding erythrose 4-phosphate dehydrogenase, 1-deoxy-D-xylulose-5-phosphate synthase, and pyridoxol 5'-phosphate synthase would help in overcoming the rejection.

Conclusion

7. No claim is allowed.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian L Fronda whose telephone number is (571)272-0929. The examiner can normally be reached Monday-Friday between 9:00AM - 5:00PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura N Achutamurthy can be reached on (571)272-0928. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CLF

TEKCHAND SAIDHA
PRIMARY EXAMINER